

REMARKS

Claims 1-8, 10-19, and 21-23 are pending in the present application. These claims have been rejected. It is respectfully submitted that the pending claims define allowable subject matter.

I. Status Of Present Application

A final office action rejecting claims of the present application was mailed on March 5, 2004. The Applicants diligently filed a Response Under 37 C.F.R. § 1.116 on March 12, 2004, a mere seven days after the final office action was mailed. To date, the Applicants have not received an Office reply to the Response, whether such reply would be a Notice of Allowance, or an Advisory Action. The lack of reply concerns the Applicants in light of the following:

Any amendment timely filed after a final rejection should be immediately considered to determine whether it places the application in condition for allowance or in better form for appeal. An examiner is expected to turn in a response to an amendment after final rejection within 10 calendar days from the time the amendment is received by the examiner. A reply to an amendment after final rejection should be mailed within 30 days of the date the amendment is received by the Office.

Manual of Patent Examining Procedure (MPEP) at § 714.13. The Applicants are also mindful that the six month statutory expiration date is September 5, 2004 (although this date falls on the Labor Day holiday weekend).

The undersigned has checked the USPTO PAIR system repeatedly over the past few weeks to see if any action has been taken with respect to this application. However, no such action has occurred. Additionally, the undersigned has contacted the Examiner, the

Examiner's former supervisor, and the Examiner's supervisor to determine whether an advisory action or a Notice of Allowance would be forthcoming. Unfortunately, no definitive answer has been given to the undersigned other than "the Examiner is working on it."

"In no event can the statutory period for reply expire later than 6 months from the mailing date of the final rejection." MPEP at § 706.07(f). In order to ensure that the present application is not abandoned, the Applicants submit the present Submission, along with an RCE, in advance of the statutory expiration date of September 5, 2004. The Applicants respectfully submit that no extension fees are required due to the fact that no advisory action has yet been received.

All final rejections setting a 3-month shortened statutory period (SSP) should contain one of form paragraphs... advising applicant that if the reply is filed within 2 months of the date of the final Office action, the shortened statutory period will expire at 3 months from the date of the final rejection or on the date the advisory action is mailed, whichever is later. Thus, a variable reply period will be established.

Id. As noted above, the Applicants filed a Response to the Final Office Action within seven days of its mailing date. Thus, the shortened statutory period for reply expires on "the date the advisory action is mailed." Because an advisory action still has not been mailed, the shortened statutory period for reply still has not expired. As such, the Applicants respectfully submit that no extension of time fee is required in connection with this Submission and RCE. Nevertheless, as indicated on the RCE and below, the Commissioner

is authorized to charge any necessary fees in connection with the RCE and this Submission to the Deposit Account 07-0845.

II. The Claims Of The Present Application Should Be In Condition For Allowance

Claims 1-6, 8, 10-17, 19, and 21-23 were rejected under 35 U.S.C. 102(e) as being anticipated by United States Patent No. 6,315,723 ("Robinson"). Claims 7 and 18 were rejected under 35 U.S.C. 103(a) as being unpatentable over Robinson in view of United States Patent No. 5,873,830 ("Hossack"). In addition to the reasons previously set forth, the Applicants respectfully traverse the rejections for the reasons set forth below.

The Applicants first turn to the rejection of claims 1-6, 8, 10-17, 19, and 21-23 under 35 U.S.C. 102(e) as being anticipated by Robinson. The Office Action notes that "Robinson et al's teaches that scanline echo signals are filtered to use only the signals that are in correct depth and spatial alignment (col. 5, lines 48-63; col. 6, lines 23-42)," and then concludes that "Robinson et al utilize complete scanlines to form the composite line." The first portion of Robinson that the Office Action cites to support this conclusion states the following:

Referring to FIG. 7, a second embodiment of an ultrasonic diagnostic imaging system constructed in accordance with the principles of the present invention is shown. An array transducer 12 of a probe 10 is controlled by a transmitter 14 to transmit ultrasonic beams with different transmit focal characteristics into a body. The transmitter also steers the beams in desired beam directions. Echoes from within the body are produced in response to each transmitted beam and are received by the elements of the array transducer 12. The echoes are coupled to a beamformer 16 where they are appropriately delayed and combined to form coherent echo

signals along each received scanline. In a conventional ultrasound system these scanline echo signals are filtered by a filter 22, detected by a detector 24 or Doppler processed by signal processor 26, then arranged into an image format by an image processor 28. The image signals are then displayed on a display 30.

Robinson at column 5, lines 48-64. However, there is nothing in this passage that leads one to conclude that "first and second weighted echoes [are combined] along said *entire* scan line to form a composite scan line in an ultrasound image," as recited, for example, in claim 1 of the present application. At best, this portion states that the "echoes are coupled to a beamformer 16 where they are appropriately delayed and combined to form coherent echo signals along each received scanline." *Id.* at column 5, lines 56-58. Again, however, this citation does not state that the echoes are combined along the *entire* scan line.

The second portion of Robinson that the Office Action relies on reads as follows:

Prior to being combined the echo signals of the respective beams are locationally aligned by time variable delays 52, 54 and 56 and appropriately weighted by weighting circuits comprising multipliers 42, 44, and 46, to which time variable weighting functions... are applied from coefficient stores 32, 34 and 36. The delayed and weighted r.f. echo signals from the multiple scans of the scanline are coherently combined by a summing circuit 48 to produce a composite scanline which synthesizes the effect of a dynamic transmit focus. The effect of the weighting circuits is to weight the relative contributions of the echo signals from the three beams to the composite scanline. Preferably this weighting is functionally related to the transmit aperture and the distances of each echo signal from its respective transmit focal point and the other

focal points used in the combination process. The effect of the delays is to locationally align the r.f. echo signals being combined so that possible phase cancellation resulting from the combination of locationally mismatched signal data is reduced and preferably minimized.

Id. at column 6, lines 23-42. Once again, however, there is nothing within this passage that would lead one to conclude that "first and second weighted echoes [are combined] along said *entire* scan line to form a composite scanline in an ultrasound image," as recited, for example, in claim 1 of the present application.

Robinson later clarifies how the echoes are combined with respect to a scan line distance:

There are several aspects of the present invention which make possible such improvement. One is that two scanlines are not simply butt-fit segments or segments cross-faded at the zone boundary as in the prior art. Instead, echoes over a *substantial portion* of the scanlines are processed and combined. *Preferably* echoes are combined over *at least half of the distance (depth) from one focal point to the next*. The characteristic shown in FIG. 5 results from the processing and combining of echo signals over the *full distance from focal point 72 to focal point 74*.

Id. at column 4, line 59 to column 5, line 1 (emphasis added). The system and method of Robinson combines echoes over a *substantial portion*¹ of the scan lines. In particular, echoes are combined over *at least half of the distance from one focal point to the next*. The distance from one focal point to the next is not the entire distance of the scan line. Even

¹ As previously discussed, a portion, by definition, is not a whole, even if the portion is "substantial."

if echoes were combined over the entire distance from one focal point to the next, that distance still would not be the "entire scan line."

In fact, Robinson further emphasizes that only portions of scan lines, but not scan lines in their entireties, are used:

A preferred embodiment of the present invention, as discussed above, combines scanline *segments* which spatially overlap for an appreciable range, *generally at least half the distance between focal points and preferably for the full distance between focal points* as illustrated in FIGS. 5, 6a, and 6b.

Id. at column 8, line 63 to column 9, line 1 (emphasis added). The Applicants note that a segment is a portion of a whole. Webster's Collegiate Dictionary, 10th Edition, defines a segment, inter alia, as "a separate piece of something... one of the constituent parts into which a body, entity, or quantity is divided or marked off by or as if by natural boundaries...."

The Applicants respectfully submit that Robinson clearly discloses that echoes over only portions, or segments, of scan lines are combined. At most, echoes over *segments*, which are constituent parts, of a scan line from focal point to focal point, are combined, as clearly stated at column 8, lines 63 to column 9, line 1. Thus, the Applicants respectfully submit that Robinson does not teach, nor suggest, "combining said first and second echoes along said entire scan line to form a composite scan line in an ultrasound image," as recited, for example, in claim 13 of the present application; nor does Robinson teach, or suggest, "combining said first and second weight echoes along said entire scan line to form a composite scan line in an ultrasound image," as recited, for example, in claim 1 of the present application. Thus, at least for these reasons, the claims of the present application

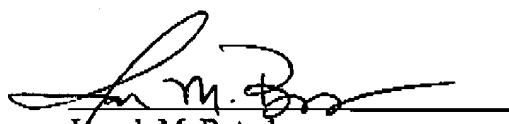
should be in condition for allowance.

In light of the above, the Applicants request reconsideration of the rejections of the pending claims of the present application and look forward to working with the Examiner to resolve any remaining issues in the application. If the Examiner has any questions or the Applicants can be of any assistance, the Examiner is invited to contact the Applicants. The Commissioner is authorized to charge any necessary fees or credit any overpayment to USPTO Account No. 07-0845.

Respectfully submitted,

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